Coil S is arranged on this lever arm H in order to oppose a deflection of lever arm H.

As Figure 4 likewise clarifies, only those force-translating elements in which all introduced or exiting forces are directed in parallel or antiparallel are used in the arrangement selected as an example.

If a tensile force directed downwards acts on coupling element N_1, then a bearing force in the opposite direction is produced in bearing point L_1, while a tensile force is created at coupling element N_2. The latter is compensated in bearing point L_2 and in coupling element N_3 by an opposing pressure force.

From this there originates in bearing point L_3 a tensile force acting in the Y direction, and the force ultimately moving the coil also points in the Y direction or in the direction opposite thereto. Depending on the type of force (tensile or compressive force) that is introduced into coupling element N_1, the directions of the respectively transferred forces change (in the Y direction or in the opposite direction antiparallel thereto). Forces in the X direction or in the Z direction, not shown, do not appear however, and therefore need not be absorbed at bearing points L_1, L_2 and L_3.

Claims

1. Monolithic weight sensor (W) for an electronic balance on the principle of electromagnetic force compensation by means of a coil (S), with a stationary base body (G) and a load receiver (A), spaced in a first direction (X) away from base body (G) and guided by means of parallel guide elements (P), which is movable in a second direction (Y),

a) with force-translating elements (K_1, K_2, K_3, K_n), arranged in series, acting in the sense of levered force translation,

b) wherein first force-translating element (K_1) is coupled via a coupling element to load receiver (A) to receive a load acting on load receiver (A) in direction (Y), and

c) wherein an imaginary plane (E) extending in direction (X) and (Y) symmetrically divides load receiver (A) or the weight introduced into the latter,

characterized in that

d) at least one force-translating element (K_i) is constructed asymmetrically relative to plane (E).

2. Monolithic weight sensor (W) according to Claim 1, characterized in that the impinging forces on at least one force-translating element (K_i) are all oriented parallel or antiparallel to one another.

3. Monolithic weight sensor (W) according to Claim 1 or 2, characterized in that the impinging forces on each force-translating element (K_1, K_2, K_3, K_n) are all oriented parallel or antiparallel to one another.

4. Monolithic weight sensor (W) according to one of the preceding claims, characterized in that force-translating elements (K_1, K_2, K_3, K_n) are arranged essentially in a spiral shape.

5. Monolithic weight sensor (W) according to Claim 4, characterized in that one section of final force-translating element (K_n) or a lever arm (H) arranged thereon penetrates the spiral structure from the inside to the outside in order to introduce or remove a force on the outside.

6. Monolithic weight sensor (W) according to one of the preceding claims, characterized in that a projecting part (T) of base body (G) extends between force-translating elements (K_1, K_2, K_3, K_n) and forms bearing points (L_1, L_2, L_3, L_n) for at least one part of force-translating elements (K_1, K_2, K_3, K_n).

7. Monolithic weight sensor (W) according to Claim 6, characterized in that projecting part (T) of the base body is formed asymmetrically relative to plane (E).

8. Monolithic weight sensor (W) according to Claim 6 or 7, characterized in that projecting part (T) of base body (G) comprises at least one gradation in direction (X) and/or in the direction (Z) perpendicular to plane (E).

9. Monolithic weight sensor (W) according to one of Claims 6-8, characterized in that the rigidity of projecting base body part (T) in the area of a bearing point (L_i) is qualitatively or proportionally formed according to the force acting at bearing point (L_i) from the associated force-translating element (K_j).

10. Monolithic weight sensor (W) according to one of Claims 6-9, characterized in that at least one section of projecting base body part (T) occupies the maximum height between parallel guide elements (P) in the Y-direction.

11. Monolithic weight sensor (W) according to one of Claims 6-10, characterized in that the cutouts arranged between the elements to define the latter are cut in from only one machining side.

12. Monolithic weight sensor (W) according to one of the preceding claims, characterized in that parallel guide elements (P) oriented in the X direction have no cutouts in the Y direction.

13. Monolithic weight sensor (W) according to one of the preceding claims, characterized in that weight sensor (W) does not exceed an elongation of 30 mm in the Z direction.

14. Monolithic weight sensor (W) according to one of the preceding claims, characterized in that coil (S) is arranged such that plane (E) symmetrically divides coil (S).